

## CA-NV AWWA Water Loss Technical Assistance Program Wave 4 Water Audit Level 1 Validation Document

### Audit Information:

Utility: Greenfield      PWS ID: 2710008  
System Type: Potable      Audit Period: Calendar 2016  
Utility Representation: Arturo Felix, Maria Vidal  
Validation Date: 5/31/2017      Call Time: 9:00am

Sufficient Supporting Documents Provided: Yes

### Validation Findings & Confirmation Statement:

#### Key Audit Metrics:

Data Validity Score: **54**    Data Validity Band (Level): Band III (51-70)  
ILI: **1.13**      Real Loss: **14.46** (gal/conn/day)      Apparent Loss: **11.28** (gal/conn/day)  
Non-revenue water as percent of cost of operating system: 2.6

#### Certification Statement by Validator:

This water loss audit report has been Level 1 validated per the requirements of California Code of Regulations Title 23, Division 2, Chapter 7 and the California Water Code Section 10608.34.

All recommendations on volume derivation and Data Validity Grades were incorporated into the water audit. ☒

### Validator Information:

Water Audit Validator: Drew Blackwell / Larry Lewison (support)    Validator Qualifications: Contractor for CA-NV AWWA Water Loss TAP

Validator Provided

## Greenfield Water Schematic





Page | 3

#	AWWA Water Audit Input	Code	Final DVG	Basis on Input Derivation	Basis on Data Validity Grade
				Comments: Lag-time correction is not employed in input derivation. Input derivation from supporting documents confirmed. Exclusion of non-potable volumes confirmed.	Meter replacement policy: Based on an age threshold per manufacturer guidelines. Number of replacements/year: Replacing approximately 200 meters per year. In addition, roughly 25% of meter population changed out in 2016 for meter changeout project. Billing data auditing: Standard billing QC, plus review of volumes by use type each billing cycle. Financial auditor performs sampling review on select accounts each year. Comments: 96% of meters were recently changed to AMI in May, 2017 with a goal of 100% by end of 2017.
8	Billed unmetered	BUAC	7	Profile: One unmetered account single family resident with estimated volume. Also, include a few small commercial accounts. Input derivation: Extrapolation from like use data on metered connections. Comments: No additional comments.	Policy for metering exemptions: All connections require metering but a few unmetered connections remain. Comments: Receive a flat rate bill each month.
9	Unbilled metered	UMAC	3	Profile: Very large park (Patriot Park) provided water service as unbilled account. Input derivation: Used well readings to take the difference from VOS for City usage and the remainder amount applied as Park usage. Comments: Input derivation from supporting documents confirmed.	Policy for billing exemptions: No policy established at this time. Comments: Note for 2017, metered usage will be managed as a Billed account.
10	Unbilled unmetered	UUAC	5	Profile: Operational flushing, overflows and fire department usage. Comments: Flushing activities greatly scaled back due to drought. Custom California default of 0.25%WWS utilized.	Comments: Default grade applied.
11	Unauthorized consumption	UC	5	Comments: Default input applied.	Comments: Default grade applied.
12	Customer metering inaccuracies	CMI	2	See BMAC comments regarding meter testing & replacement activities. Input derivation: Rudimentary estimate. Comments: No testing records are available to derive any field verified calculation.	Characterization of meter testing: Limited (upon request AND consumption flag only). Characterization of meter replacement: Limited (upon failure only). Comments: No additional comments.



#	AWWA Water Audit Input	Code	Final DVG	Basis on Input Derivation	Basis on Data Validity Grade
13	Systematic data handling errors	SDHE	5	Comments: Default input applied.	Comments: Default grade applied.
14	Length of mains	Lm	5	Input derivation: Rudimentary estimate. Hydrant leads included: Yes. Comments: Used to have GIS but service and data is no longer available.	Mapping format: Paper. Asset management database: Not currently in place. Map updates & field validation: Accomplished through normal work order processes. Comments: Good policy exists for new additions to system.
15	Number of service connections	Ns	4	Input derivation: Standard report run from billing system. Basis for database query: Account ID - non-premise based. Comments: Only Active service connections included in supporting documents. Inactive connections managed internally and 42 connections were added as an estimate.	GIS updates & field validation: Accomplished through normal meter reading processes. Estimated error of total count within: 5%. Comments: No additional comments.
16	Ave length of cust. service line	Lp	10	Comments: Default input and grade applied, as customer meters are typically located at the property boundary given California climate.	Extent of static pressure data collection: Collected currently, but not added to average pressure measurement.
17	Average operating pressure	AOP	4	Typical pressure range: 50 – 68 psi Input derivation: Inferred from observations of pressure readings in field or review of pressure measurements. Comments: No additional comments.	Characterization of real-time pressure data collection: Basic - telemetry or pressure logging at boundary points (supply locations, tanks, PRVs, boosters). Hydraulic model: One exists but has not been calibrated within the last 5 years. Comments: No additional comments.
18	Total annual operating cost	TAOC	10	Input derivation: From internal budgeting reports. Comments: Confirmed costs limited to water only, and water debt service included.	Frequency of internal auditing: Annually. Frequency of third-party CPA auditing: Annually. Comments: No additional comments.
19	Customer retail unit cost	CRUC	8	Input derivation: Weighted average with all selected Sewer charges are not based on water meter readings. Sewer revenues are not applicable. Comments: Multi-tier rate structure in place, effective 8/1/2016.	Characterization of calculation: Weighted average composite of all rates. Input calculations have not been reviewed by an M36 water loss expert.







#	AWWA Water Audit Input	Code	Final DVG	Basis on Input Derivation	Basis on Data Validity Grade
20	Variable production cost	VPC	4	Supply profile: Own sources only. Primary costs included: Treatment chemicals and supply & distribution power. Secondary costs included: None currently included. Comments: No additional comments.	Comments: Provided weighted CRUC worksheet to calculate the weighted retail cost. Grade applied as a placeholder until pending item provided.  Characterization of calculation: Primary costs only. Input calculations have not been reviewed by an M36 water loss expert. Comments: Grade of 4 assigned for using primary costs.



#### Key Audit Metrics

(~)	VALIDITY	Data Validity Score: 54	Data Validity Band (Level): Band III (51-70)
(#)	VOLUME	ILI: 1.13	Real Loss: 14.46 (gal/conn/day)
(\$)	VALUE	Annual Cost of Apparent Losses: 21,347	Apparent Loss: 11.28 (gal/conn/day)
			Annual Cost of Real Losses: 11,695

#### Infrastructure & Water Loss Management Practices:

Infrastructure age profile: 25% is over 50 years old and remainder is younger. Infrastructure replacement policy (current, historic): Replaced, as needed.

Estimated main failures/year: no main breaks recalled Estimated service failures/year: 50/year

Extent of proactive leakage management: No

Other water loss management comments: No

#### Comments on Audit Metrics & Validity Improvements

The Infrastructure Leakage Index (ILI) of 1.13 describes a system that experiences leakage at 1.13 times the modeled technical minimum for its system characteristics.

The Data Validity Score falling within Band III (51-70) suggests that next steps may be focused simultaneously on improving data reliability and evaluating cost-effective interventions for water & revenue loss recovery. Opportunities to improve the reliability of audit inputs and outputs include:

- Improved understanding of Supply Meter (Own or Import) Master Meter Error: consider adopting or increasing the rigor of a source meter volumetric testing and calibration program, informed by the guidance provided in AWWA Manual M36 – Appendix A.
- Temporal alignment of Billed Metered Authorized Consumption with Water Supplied: consider pro-rating the first and last months of the audit period to better align consumption with actual dates of use, and using read date as basis for reporting.
- Improved estimation of CMI: consider a customer meter testing program which tests a sample of random meters whose stratification (by size, age, or other characteristics) represents the entire customer meter stock.

When the CA-NV AWWA Water Audit Validator (WAV) program comes online after this year, is the utility planning on having a staff member become certified to perform the Level 1 Validation for future audits? Unsure, but likely.





## CA-NV AWWA Water Loss Technical Assistance Program

### Wave 4 Water Audit Level 1 Validation Document

#### Audit Information:

Utility: Greenfield	PWS ID: 2710008
System Type: Potable	Audit Period: Calendar 2016
Utility Representation: Arturo Felix, Maria Vidal	
Validation Date: 5/31/2017	Call Time: 9:00am
	Sufficient Supporting Documents Provided: Yes

#### Validation Findings & Confirmation Statement:

##### Key Audit Metrics:

Data Validity Score: 54	Data Validity Band (Level): Band III (51-70)
ILI: 1.13	Real loss: 14.46 (gal/conn/day)
	Apparent loss: 11.28 (gal/conn/day)
Non-revenue water as percent of cost of operating system: 2.6	

Validator Provided

##### Certification Statement by Validator:

This water loss audit report has been Level 1 validated per the requirements of California Code of Regulations Title 23, Division 2, Chapter 7 and the California Water Code Section 10608.34.

All recommendations on volume derivation and Data Validity Grades were incorporated into the water audit. ☒

#### Validator Information:

Water Audit Validator: Drew Blackwell / Larry Lewison (support)      Validator Qualifications: Contractor for CA-NV AWWA Water Loss TAP



**CA-NV AWWA Water Loss Technical Assistance Program**  
**Wave 4 Water Audit Level 1 Validation Document**

Water System Name:

Water System ID Number:

Water Audit Period: Select

**Water Audit & Water Loss Improvement Steps:**

*Steps taken in preceding year to increase data validity, reduce real loss and apparent loss as informed by the annual validated water audit:*

<<Information to be completed by Utility>>

**Certification Statement by Utility Executive:**

This water loss audit report meets the requirements of California Code of Regulations Title 23, Division 2, Chapter 7 and the California Water Code Section 10608.34 and has been prepared in accordance with the method adopted by the American Water Works Association, as contained in their manual, *Water Audits and Loss Control Programs, Manual M36, Fourth Edition* and in the Free Water Audit Software version 5.

Utility Provided

Michael A. Steinmann  
Executive Name (Print)

Community Services Dir.  
Executive Position

[Signature]  
Signature

9-29-17  
Date